

**What is claimed is:**

- Sub. 91*
1. A natural gas dehydrator wherein a supply of natural gas is fed into an absorber wherein it is subjected to dry glycol to remove undesirable materials therefrom so that the dry glycol is changed into wet glycol that is removed from the absorber comprising:
- separator apparatus for receiving said wet glycol from said absorber;
  - said separator apparatus having structure for holding a predetermined amount of said wet glycol;
  - said separator apparatus having additional structure for receiving excess wet glycol from said structure;
  - reboiler apparatus for receiving said excess wet glycol and changing said excess wet glycol into dry glycol and effluents;
  - condenser apparatus for receiving said effluents;
  - circulating apparatus for circulating wet glycol from said structure through said condenser apparatus to change said effluents to at least liquid water, liquid hydrocarbons and uncondensed vapors and returning said circulating wet glycol to said separator apparatus;
  - liquid water removal separator apparatus for receiving said at least liquid water, liquid hydrocarbons and uncondensed vapors and for separating and removing said liquid water; and
  - apparatus for removing said liquid hydrocarbons and said uncondensed vapors from said liquid water removal separator apparatus and feeding said liquid hydrocarbons and said uncondensed vapors to said separator apparatus.
2. A natural gas dehydrator as in claim 1 wherein said apparatus comprises:
- an eductor having an inlet port, an exit port and a vacuum port;
  - a first conduit through which said circulating wet glycol flows connected to said inlet port;
  - a second conduit extending between said outlet port and said separator apparatus; and

a third conduit extending between said liquid water removal separator apparatus and said vacuum port.

10. A natural gas dehydrator as in claim 9 wherein said liquid water removal separator apparatus comprises:

a hollow shell;

a partition in said hollow shell for forming at least a first and a second chamber in said hollow shell;

a first outlet port in said first chamber;

said third conduit being connected to said first chamber for forming a vacuum therein;

a first inlet port in said first chamber so that said at least liquid water, liquid hydrocarbons and uncondensed vapors can flow into said first chamber and be separated into at least an upper layer comprising said uncondensed vapors, a middle layer comprising said liquid hydrocarbons and a lower layer comprising said liquid water;

said first outlet port being located so that said uncondensed vapors and said liquid hydrocarbons flow through said first outlet port into said third conduit;

a second outlet port in said first chamber;

a second inlet port in said second chamber;

a conduit connecting said second outlet port and said second inlet port so that said liquid water can flow from said first chamber into said second chamber; and

a drain port in said second chamber for draining said liquid water from said second chamber.

11. A natural gas dehydrator as in claim 10 and further comprising:  
at least one gas emitting level control apparatus in at least said absorber, said separator apparatus and said liquid water removal separator apparatus;

a gas inlet port in said first chamber of said liquid water removal separator apparatus;

collecting apparatus for collecting said gases emitted from said gas emitting level control apparatus; and

conduits extending between said collecting apparatus and said gas inlet port for transmitting said gases to said gas inlet port.

<sup>12</sup> 12. A natural gas dehydrator as in claim <sup>8</sup> 8 wherein said liquid water removal separator apparatus comprises:

a hollow shell;

a partition in said hollow shell for forming at least a first and a second chamber in said hollow shell;

a first outlet port in said first chamber;

a first inlet port in said first chamber so that said at least liquid water, liquid hydrocarbons and uncondensed vapors can flow into said first chamber and be separated into at least an upper layer comprising said uncondensed vapors, a middle layer comprising said liquid hydrocarbons and a lower layer comprising said liquid water;

said first outlet port being located so that said uncondensed vapors and said liquid hydrocarbons flow through said first outlet port;

a second outlet port in said first chamber;

a second inlet port in said second chamber;

a conduit connecting said second outlet port and said second inlet port so that said liquid water can flow from said first chamber into said second chamber; and

a drain port in said second chamber for draining said liquid water from said second chamber.

<sup>13</sup> 13. A natural gas dehydrator as in claim <sup>12</sup> 12 and further comprising:  
at least one gas emitting level control apparatus in at least said absorber, said separator apparatus and said water separator apparatus;  
a gas inlet port in said first chamber;

collecting apparatus for collecting said gases emitted from said gas emitting level control apparatus; and  
conduits extending between said collecting apparatus and said gas inlet port for transmitting said gases to said gas inlet port.

7. A natural gas dehydrator as in claim 1 and further comprising:  
at least one gas emitting level control apparatus in at least said absorber, said separator apparatus and said water separator apparatus;  
a gas inlet port in said first chamber;  
collecting apparatus for collecting said gases emitted from said gas emitting level control apparatus; and  
conduits extending between said collecting apparatus and said gas inlet port for transmitting said gases to said gas inlet port.

8. A method wherein a supply of natural gas is fed into an absorber wherein it is subjected to dry glycol to remove undesirable materials therefrom so that the dry glycol is changed into wet glycol that is removed from the absorber comprising:

feeding said wet glycol from said absorber into a separator apparatus;  
collecting a supply of wet glycol to a predetermined level in said separator apparatus;  
feeding excess wet glycol greater than said predetermined level from said separator apparatus to a reboiler for changing said excess wet glycol into dry glycol and effluents;  
feeding said effluents to a condenser apparatus;  
circulating wet glycol from said supply of wet glycol through said condenser apparatus to change said effluents to at least liquid water, liquid hydrocarbons and uncondensed vapors and returning said circulating wet glycol to said separator apparatus;  
feeding said at least liquid water, liquid hydrocarbons and uncondensed vapors to a liquid water removal separator apparatus;

separating said liquid water from said at least liquid water, liquid hydrocarbons and uncondensed vapors; and  
feeding said at least liquid hydrocarbons and said uncondensed vapors to said separator apparatus.

2. A method as in claim 1 and further comprising:  
positioning an eductor having an inlet port, an outlet port and a vacuum port between said liquid water removal separator apparatus and said separator apparatus;  
feeding said circulating wet glycol to said inlet port;  
passing said circulating wet glycol through said eductor and out of said outlet port to create a vacuum;  
feeding said circulating wet glycol from said outlet port into said separator apparatus; and  
connecting said vacuum port to said liquid water removal separator apparatus to form a vacuum therein.

10. A method as in claim 9 and further comprising:  
forming a first and a second chamber in said liquid water removal separator apparatus;  
feeding said at least liquid water, liquid hydrocarbons and uncondensed vapors into said first chamber;  
separating said at least liquid water, said liquid hydrocarbons and uncondensed vapors in said first chamber;  
removing said liquid hydrocarbons and said uncondensed vapors from said first chamber and passing said removed liquid hydrocarbons and said uncondensed vapors to an eductor;  
transferring at least a portion of said liquid water from said first chamber to said second chamber until said liquid water in said second chamber reaches a predetermined level; and  
removing at least a portion of said liquid water from said second chamber.

- Sub. G3*
11. A method as in claim 10 and further comprising:  
 providing at least one gas emitting level control apparatus in at least said absorber, said separator apparatus and said liquid water removal separator apparatus;  
 collecting said gases emitted by said gas emitting level control apparatus; and  
 feeding said collected gases into said first chamber.

- 5* 12. A method as in claim 8 and further comprising:  
 forming a first and a second chamber in said liquid water removal separator apparatus;  
 feeding said at least liquid water, liquid hydrocarbons and uncondensed vapors into said first chamber;  
 separating said at least liquid water, said liquid hydrocarbons and uncondensed vapors in said first chamber;  
 removing said liquid hydrocarbons and said uncondensed vapors <sup>from</sup> ~~from~~ said first chamber;  
 transferring at least a portion of said liquid water from said first chamber to said second chamber until said liquid water in said second chamber reaches a predetermined level; and  
 removing at least a portion of said liquid water from said second chamber.

- Sub. G4*
13. A method as in claim 12 and further comprising:  
 providing at least one gas emitting level control apparatus in at least said absorber, said separator apparatus and said liquid water removal separator apparatus;  
 collecting said gases emitted by said gas emitting level control apparatus; and  
 feeding said collected gases into said first chamber.
14. A method as in claim 8 and further comprising:

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providing at least one gas emitting level control apparatus in at least said absorber, said separator apparatus and said liquid water removal separator apparatus;

collecting said gases emitted by said gas emitting level control apparatus; and

feeding said collected gases into said first chamber.

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